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# A STUDY OF THE SOURCE OF CONTAMINATION

# IN POTABLE WATER WELLS

# IN THE COMMUNITY OF OWYHEE, NEVADA

# ON THE DUCK VALLEY INDIAN RESERVATION

# HOME OF THE SHOSHONE-PAIUTE INDIAN TRIBES

BUREAU OF INDIAN AFFAIRS
PHOENIX AREA OFFICE

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# A STUDY OF THE SOURCE OF CONTAMINATION OF POTABLE WATER WELLS IN THE COMMUNITY OF OWYHEE, NEVADA ON THE DUCK VALLEY INDIAN RESERVATION

## EXECUTIVE SUMMARY

The Branch of Water Resources Management and Protection prepared this report at the request of the Branch of Environmental Quality Services, Phoenix Area Office and by Environmental Services, Central Office, BIA. Their request was to review what is known, to collect samples from Owyhee, Nevada, have the samples analyzed, evaluate the problem, report the findings, and attempt to identify the contaminant(s) and the contamination source(s).

Contaminated water has been found in the public water supply in Owyhee, Nevada, located on the Duck Valley Indian Reservation. The first oil smell was noticed in October, 1987. When the 30-Hp well was returned to service in March 1988 the oil smell was so strong that the 30-Hp well used for potable water was discontinued and the 10-Hp well, 250 ft away, has been used since. Past correspondence indicates that excavations constructed to groundwater, at 13 ft, in March 1988 found petroleum floating on the groundwater surface. It has been alleged that the BIA buried fuel oil pipelines (at 4 ft depth) may be a source of contamination in the groundwater found in the two wells (30-Hp and 7.5-Hp wells which are 30 ft apart) of the three potable water wells.

Various parties, including the Indian Health Service (IHS), the Bureau of Indian Affairs (BIA) and the Environmental Protection Agency (EPA), have sampled the water and had it analyzed for contamination. Testing to date has not identified a source. The source(s) of the contamination is not known, although several possibilities exist.

On October 27 and 28, 1993, Dr. E. H. "Ted" Curtis, Engineer, Water Resources, PAO, BIA and Mr. Danny Pounders, Facility Management, PAO, BIA collected samples in Owyhee, NV, and searched for information on events related to possible contamination of wells in Owyhee. The samples collected included: 13 water samples, 22 soil samples, four (4) wipe test samples, one (1) solvent fluid, and one (1) road crack seal product sample.

Specific compounds measured in the analyses are tabulated and the analytical methods included: Compound Analysis of Water Samples, Method 502.2, Organic Monitoring, Drinking Water Volatiles, Full Suite; Compound Analysis of Liquid Samples, Method 8010, Halogenated Volatile Organics and Method 8020, Aromatic Volatiles; and Compound Analysis of Solid Samples, Method 8010, Halogenated Volatile Organics and Method 8020, Aromatic Volatiles.

A table lists each sample, the analysis performed and the contaminant levels found when contaminants were found. Two (2) out of the 13 water samples had contamination and nine (9) out of 22 soil samples had contamination. Another table lists and summarizes the detected contamination for each sample. Contamination that was identified included: benzene, toluene, ethylbenzene, and total xylenes (BTEX). These components are typical constituents of gasoline. Diesel and fuel oil typically have specific hydrocarbons that are heavier, larger molecules. Only one other compound, 1,1-Dichloroethane, was found; it was in one soil sample. Not every sample had all of these BTEX compounds, but

collectively the data indicates that contamination at these locations appears to be gasoline.

RECOMMENDATION NUMBER 1

Further characterization of the groundwater should be conducted to evaluate the groundwater contamination plume extent and location; and to determine, if possible, the contamination source. Modified EPA Method 8015 and EPA Method 602 or 502.2 should be used on water samples to identify the presence of total petroleum hydrocarbons (TPH), BTEX, and volatile organics respectively.

RECOMMENDATION NUMBER 2

Each owner (e.g. BIA, school district, private, or other) of an underground or aboveground storage tank which now contains, or in the past did contain regulated substances (e.g. diesel fuel or gasoline) should examine the potential for soil contamination under there tanks and their associated product piping.

RECOMMENDATION NUMBER 3

Because the heating oil pipeline has been an alleged source of contamination (March 1988 excavations to groundwater), and because the heating oil pipeline is not projected to be used, the heating oil pipeline in the well area should be removed. The BIA heating oil pipeline should be retested (possibly in segments) to verify whether or not it still has integrity. Any heating oil pipeline removal needs to be accompanied with a TPH testing program in the soil immediately below the pipeline to confirm or deny this pipeline as a source of the groundwater contamination. In addition, other underground pipelines should be evaluated.

RECOMMENDATION NUMBER 4

Each owner (e.g. BIA, school district, private or other,) of a facility that potentially discharged contaminats (e.g. drain lines and discharge or spill locations) should examine the potential for soils and/or groundwater contamination from these sources.

RECOMMENDATION NUMBER 5

A plan for an adequate potable water supply for the Community of Owyhee needs to be prepared. That plan would include a plan of operation for the 7.5-Hp, 10-Hp and 30-Hp wells. This plan should include:

5.1 Groundwater quality monitoring for future use of the 7.5-Hp, 10-Hp and 30-Hp wells.

5.2 Identify an alternative source of potable water or a treatment system to produce potable water for the Community of Owyhee in the event the 10-Hp well becomes contaminated and for possible future growth.

RECOMMENDATION NUMBER 5 Continued

5.3 Continued future use of the 10-Hp well for potable water for the Community of Owyhee. In the event contaminants were identified in water from the 10-Hp well; then, possible actions may include:
5.3.1 Installation of a water treatment system.
5.3.2 Use of the alternative water source.
5.3.3 Discontinued use of the 10-Hp well for potable water and possible use for other than drinking water purposes.

5.4 Future use of the 7.5-Hp and 30-Hp wells for non-potable purposes without a water treatment system, unless in time, the water becomes reliably potable.

5.5 Evaluation of the initial and operational costs for a water treatment system for the existing wells versus obtaining an alternative source of drinking water.